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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,188	09/10/2003	Jeffrey Wayne Eberhard	RD-28,444-2	8797
6147	7590	04/09/2004	EXAMINER	
GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 SCHENECTADY, NY 12301-0008			HO, ALLEN C	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 04/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,188

Applicant(s)

EBERHARD ET AL.

Examiner

Allen C. Ho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10092003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, multiple independently positionable sections with different boundary shapes as claimed in claim 41 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the rotationally movable sides as claimed in claim 43 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
Page 7, paragraph [0027], line 1, "aperture" should be replaced by --collimator--.
Appropriate correction is required.

Claim Objections

4. Claims 36 and 37 are objected to because of the following informalities: The claims used the phrase "configured to". Language, such as "configured to", that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. MPEP § 2106. The applicants are advised to amend the claims so that the limitations are positively stated. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 43 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants failed to describe rotationally movable sides in the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 36-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Wofford *et al.* (U. S. Patent No. 6,260,999 B1).

With respect to claim 36, Wofford *et al.* disclosed a radiation imaging system comprising: a movable radiation source (15, 17); a radiation detector (24); a collimator (19) comprising adjustable geometry aperture assembly configured such that an adjustment of the aperture geometry is synchronized with the movement of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector.

With respect to claim 37, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Wofford *et al.* disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (3) for positioning the collimator.

With respect to claims 39 and 40, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (102a, 102b, 104).

With respect to claim 41, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (102a, 102b, 104) with different boundary shapes.

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With respect to claim 42, Wofford *et al.* disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 43, Wofford *et al.* disclosed the imaging system of claim 39, wherein the plurality of sides comprise rotationally and translationally movable sides (Figs. 5A and 5B).

With respect to claim 44, Wofford *et al.* disclosed a method for radiation imaging, comprising: moving (3) a radiation source (15, 17) in a plurality of radiation source positions; adjusting an aperture (19) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (24).

9. Claims 36-42 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown *et al.* (U. S. Patent No. 5,751,781).

With respect to claim 36, Brown *et al.* disclosed a radiation imaging system (Figs. 10-12) comprising: a movable radiation source (4a, 4b, SO); a radiation detector (100); a collimator (4d) comprising adjustable geometry aperture assembly (multi-leaf collimator) configured such that an adjustment of the aperture geometry is synchronized with the movement of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector.

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With respect to claim 37, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Brown *et al.* disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (501) for positioning the collimator.

With respect to claims 39 and 40, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (leaves in a multi-leaf collimator).

With respect to claim 41, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (leaves in a multi-leaf collimator) with different boundary shapes.

With respect to claim 42, Brown *et al.* disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 44, Brown *et al.* disclosed a method for radiation imaging, comprising: moving (502) a radiation source (4a, 4b, SO) in a plurality of radiation source positions; adjusting an aperture (4d) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (100).

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10. Claims 36-42 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Liebetrueth (U. S. Patent No. 5,377,252).

With respect to claim 36, Liebetrueth disclosed a radiation imaging system comprising: a movable radiation source (4); a radiation detector (5); a collimator (6) comprising adjustable geometry aperture assembly (8) configured such that an adjustment of the aperture geometry is synchronized with the movement of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector.

With respect to claim 37, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Liebetrueth disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (1) for positioning the collimator.

With respect to claims 39 and 40, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (8).

With respect to claim 41, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (8) with different boundary shapes.

With respect to claim 42, Liebetrueth disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 44, Liebetrueth disclosed a method for radiation imaging, comprising: moving (1) a radiation source (4) in a plurality of radiation source positions; adjusting an aperture (8) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (5).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Fujishige *et al.* (U. S. Patent No. 6,507,642 B2) disclosed a collimator control method and apparatus, and CT apparatus.
- (2) Popescu (U. S. Patent No. 6,501,828 B1) disclosed a method and apparatus for influencing x-rays in a beam path.
- (3) Miyazaki *et al.* (U. S. Patent No. 6,445,761 B1) disclosed an x-ray CT including a collimator that restricts irradiation range of x-ray fan beam.
- (4) Von Der Haar (U. S. Patent No. 6,320,929 B1) disclosed a method for scanning an examination subject with a CT device.
- (5) Aradate *et al.* (U. S. Patent No. 5,684,855) disclosed an x-ray CT that corrects for focal spot shifts.

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- (6) Styrnol *et al.* (U. S. Patent No. 5,299,250) disclosed a CT apparatus with compensation for focus migration by adjusting of diaphragm position.
- (7) Boomgaarden *et al.* (U. S. Patent No. 4,991,189) disclosed a collimation apparatus for x-ray beam correction.
- (8) Braden *et al.* (U. S. Patent No. 4,190,773) disclosed a shutter for rotating source CT scanner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Patent Examiner
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